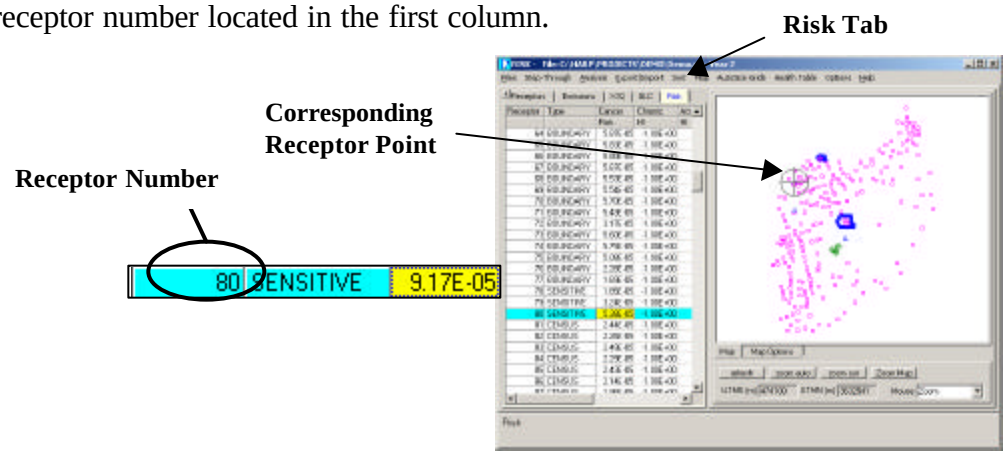
Topic 7: How to Perform a Stochastic Evaluation

Prerequisites

Before you can conduct a stochastic evaluation, you must first add your emissions data into the CEIDARS-Lite emissions inventory database within HARP and run an air dispersion analysis (See Topics 2 and 5 in the HARP How-To Guides for instructions). For more information on setting up a stochastic analysis, see Chapters 4 and 10 in the HARP User Guide.

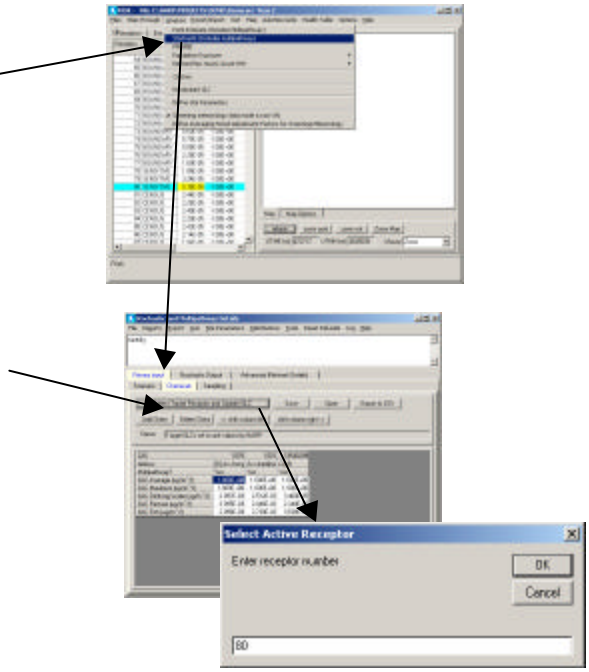
Step 1. Choosing a Receptor

The first step in conducting a stochastic evaluation is choosing a receptor. To do this, access the risk analysis module from the HARP main menu and run a point estimate risk analysis as described in Topic 6 in the HARP How-To Guides. Examine the results by clicking the ***Risk*** tab in the ***Risk*** window. Choose the receptor that you would like to run a stochastic analysis on and note the receptor number located in the first column.



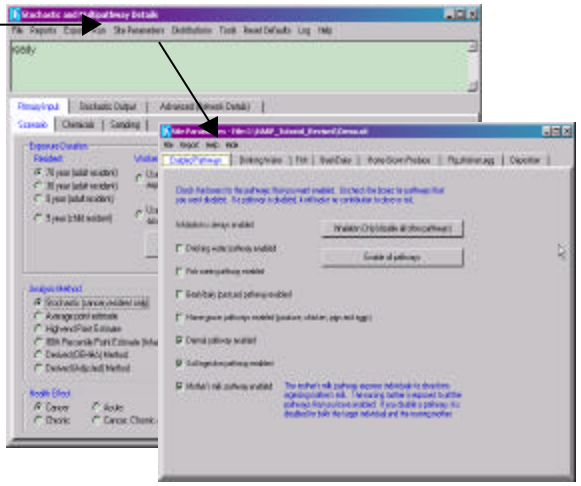
Step 2. Setting up and Running a Stochastic Simulation

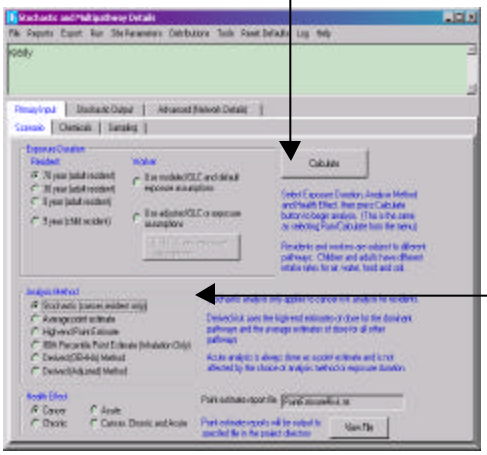
1. From the main ***Risk*** window, select ***Analysis/Stochastic (Includes Multipathway)***
2. Select the ***Primary Input*** tab and then click the ***Chemicals*** tab to access the chemical concentration data.
3. Click the button labeled ***Select Target Receptor and Update GLC*** and enter the receptor number that you noted in Step 1 into the popup window. HARP will then load the chemical names and ground level concentrations from your receptor.



Note 1: You may add a new chemical to the list by pressing the *Add Chem* button. You may delete a chemical from the list by pressing the *Delete* button. This does not affect any of the numbers on the main *Risk* window or in the HARP database.

4. Select the ***Site Parameters*** from the top menu and verify that the parameters are correct for your site. To save any changes, click ***File/Save As*** and then close the window by clicking on ***Hide*** (top menu).
5. Next, set the sampling parameters by clicking the ***Sampling*** tab and set the sampling parameters.
6. Set the exposure duration, analysis method and health effect under the ***Scenario*** tab. Make sure stochastic is checked in the analysis method.
7. Finally, press the ***Calculate*** button to start the simulation.

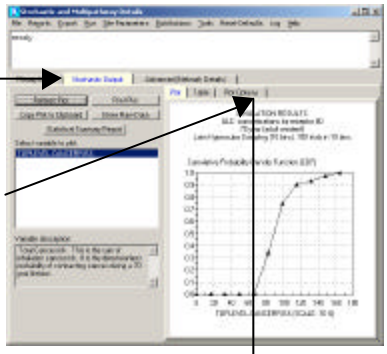




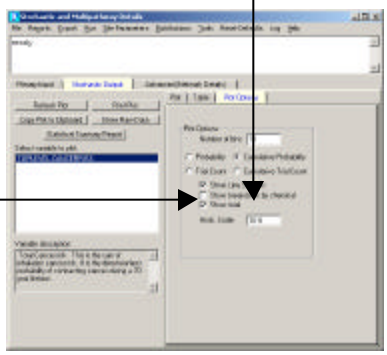
Note 2: As the scenario window indicates, you have the option of performing point estimate risk analysis at this point also. However, it will only be for a single receptor.

Make sure that "Stochastic" is selected under the analysis method.

Step 3. Viewing the Results

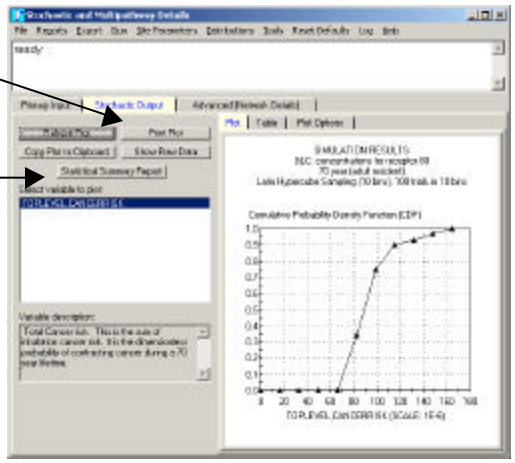


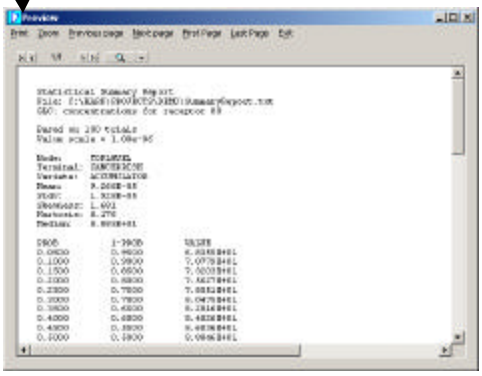
1. To view the results, click on the ***Stochastic Output*** tab and click on the ***Refresh Plot*** button. The graph shown is the cumulative probability distribution of cancer risk.
2. To change the graph, click on the ***Plot Options*** tab. From here, you may select a different plot type or change the horizontal scale. Press ***Refresh Plot*** to update the graph.
3. It is recommended that you change the scale to an appropriate one for plotting cancer risk. To do this, type "1E-6" into to ***Horiz. Scale*** field. This scales all values on the horizontal axis by multiplying them by 1,000,000. Press ***Refresh Plot*** to update the graph.
4. To display the statistical risk distribution for each of the chemicals individually, check the box next to ***Breakdown by Chemical*** in ***Plot Options***. Then press ***Refresh Plot*** to update the graph. For more information on changing the plot options and saving other variables to plot, see Chapter 10 in the HARP User Guide.



Step 4. Printing the Results and Generating a Statistical Summary Report

1. To print the graph, click on the ***Print Plot*** button.
2. To create a summary report, click ***on Statistical Summary Report*** button.
3. Once the report has been generated, a window will popup showing a preview of the report. Click Print to save the report to a file (See Note 4).





Note 4: The report will be written in the project directory. The report is an ASCII file that can be imported into a word processor.

Step 5. Continuing a Simulation

1. Select the ***Primary Input*** tab and then the ***Sampling*** tab.
2. Set the number of trials. Select ***Run/Continue Stochastic***.
3. The simulation now continues from where it left off. If it is not interrupted, it will continue until the total of number of trials have been executed. For example, your first run consists of 100 trials. After analyzing the results, you wish to continue the simulation to 200 trials. Set the number of trials to 200 and select ***Run/Continue Stochastic***. The simulation restarts at 101 and continues until 200.